

WHAT IS CLAIMED IS:

1. An ultrasonic diagnostic apparatus,
comprising:

an ultrasonic probe for transmitting ultrasound to
5 a subject having been injected with a contrast agent,
and receiving ultrasonic echo from the subject;

a driving signal generator for generating a
driving signal for driving the ultrasonic probe;

10 a control unit for performing scanning for a
plurality of times with ultrasound of such a high
intensity that the contrast agent is collapsed at a
time-varying time interval after the contrast agent is
injected, and controlling the driving signal generator
based on a scan sequence in which the time interval
15 after the scanning performed for an initial time is set
to be 5 seconds or shorter; and

a processor for plotting a time-varying
concentration graph of the contrast agent based on the
ultrasonic echo.

20 2. The ultrasonic diagnostic apparatus according
to claim 1, wherein
the measurement processor derives a mean transit time
of a blood flow based on the time-varying graph.

25 3. The ultrasonic diagnostic apparatus according
to claim 1, wherein

the control unit controls the driving signal
generator in such a manner that the initial scanning is

performed after a lapse of time in which the contrast agent is fully filled in a target part of the subject, and

5 based on a result of the initial scanning, the measurement processor standardizes a value of the scanning to be performed after the initial scanning to plot the graph.

4. An ultrasonic diagnostic apparatus, comprising:

10 an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

15 a control unit for controlling the driving signal generator based on a scan sequence in which scanning is performed for a plurality of times with a constant time interval after the contrast agent is injected; and

a processor for plotting a time-varying concentration graph of the contrast agent based on a plurality of cumulative values or average values of the ultrasonic echo as a result of the scanning performed for the plurality of times.

25 5. The ultrasonic diagnostic apparatus according to claim 4, wherein the measurement processor derives a mean transit time of a blood flow based on the time-varying graph.

6. The ultrasonic diagnostic apparatus according to claim 4, wherein

the control unit controls the driving signal generator in such a manner that the initial scanning is performed after a lapse of time in which the contrast agent is fully filled in a target part of the subject, and

based on a result of the initial scanning, the measurement processor standardizes a value of the scanning performed after the initial scanning to plot the graph.

7. An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

a control unit for controlling the driving signal generator based on a predetermined scan sequence for plotting a time-varying concentration graph of the contrast agent;

a signal processor for applying a detection process and a logarithmic transformation process to the ultrasonic echo;

an image generator for generating an ultrasonic image based on an output of the signal processor;

an antilogarithmic transformation unit for
applying an antilogarithmic transformation process to
an output signal coming from at least either of the
signal processor or the image generator; and

5 a processor for plotting a time-varying graph
based on the output signal coming from the
antilogarithmic transformation unit.

8. The ultrasonic diagnostic apparatus according
to claim 7, wherein
10 the measurement processor derives a mean transit time
of a blood flow based on the time-varying graph.

9. The ultrasonic diagnostic apparatus according
to claim 7, wherein
15 the control unit controls the driving signal
generator in such a manner that an initial scanning is
performed after a lapse of time in which the contrast
agent is fully filled in a target part of the subject,
and

20 based on a result of the initial scanning, the
measurement processor standardizes a value of the
scanning performed after the initial scanning to plot
the graph.

10. An ultrasonic diagnostic apparatus,
comprising:
25 an ultrasonic probe for transmitting ultrasound to
a subject having been injected with a contrast agent,
and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

a control unit for controlling the driving signal generator based on a predetermined scan sequence for plotting a time-varying concentration graph of the contrast agent;

a signal generator for generating a first signal as a result of a detection process and a logarithmic transformation process applied with respect to the ultrasonic echo, and a second signal as a result of the detection process applied with respect to the ultrasonic echo;

an image generator for generating an ultrasonic image based on the first signal; and
a measurement processor for plotting the time-varying graph based on the second signal.

11. The ultrasonic diagnostic apparatus according to claim 10, wherein the measurement processor derives a mean transit time of a blood flow based on the time-varying graph.

12. The ultrasonic diagnostic apparatus according to claim 10, wherein

based on a result of the scanning performed for an initial time after a lapse of time in which the contrast agent is fully filled in a target part of the subject, the measurement processor standardizes a value of the scanning performed after the initial scanning to

plot the graph.

13. An ultrasonic diagnostic apparatus,
comprising:

5 an ultrasonic probe for transmitting ultrasound to
a subject having been injected with a contrast agent,
and receiving ultrasonic echo from the subject;

a driving signal generator for generating a
driving signal for driving the ultrasonic probe;

10 a control unit for controlling the driving signal
generator based on a predetermined scan sequence for
deriving a time-varying concentration of the contrast
agent;

an image generator for generating an ultrasonic
image based on the ultrasonic echo; and

15 a measurement processor for plotting a time-
varying concentration graph of the contrast agent based
on the ultrasonic echo, and for compensating a mean
transit time of a blood flow derived from the time-
varying graph depending on a measurement position
20 depth.

14. The ultrasonic diagnostic apparatus according
to claim 13, wherein

the control unit controls the driving signal
generator in such a manner that an initial scanning is
25 performed after a lapse of time in which the contrast
agent is fully filled in a target part of the subject,
and

based on a result of the initial scanning, the measurement processor standardizes a value of the scanning performed after the initial scanning to plot the graph.

5 15. An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

10 a driving signal generator for generating a driving signal for driving the ultrasonic probe;

 a control unit for controlling the driving signal generator based on a predetermined scan sequence for plotting a time-varying concentration graph of the contrast agent;

15

an image generator for generating an ultrasonic image based on the ultrasonic echo; and

 a measurement processor for plotting the time-varying concentration graph of the contrast agent based on the ultrasonic echo, and for compensating the time-varying graph depending on a measurement position depth.

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16. The ultrasonic diagnostic apparatus according to claim 15, wherein

25 the control unit controls the driving signal generator in such a manner that an initial scanning is performed after a lapse of time in which the contrast

agent is fully filled in a target part of the subject,
and

5 based on a result of the initial scanning, the
measurement processor standardizes a value of the
scanning performed after the initial scanning to plot
the graph.